

## Flow Measurement

**A** laser velocimeter (LV) is a system used in wind tunnel testing of aircraft, missiles and spacecraft. It employs electro-optical techniques to probe the flow field as the tunnel blows air over a model of the flight vehicle, and to determine the velocity of the air and its direction at many points around the model. The LV makes measurements at rates up to one million per second and reports them to a computer.

Current state-of-the-art minicomputers, however, cannot handle the massive flow of real time data from several sources simultaneously. To compensate for this limitation, Langley Research Center developed an

instrument with the impressive name of Laser Velocimeter Autocovariance Buffer Interface (LVABI). The LVABI is an interconnecting instrument between the LV and the computer. It acquires the data from as many as six LV channels at high real time data rates, stores it in its memory, and sends it to the computer on command.

The LVABI can also acquire data from other instrumentation used in conjunction with the LV. In wind tunnel testing, the LVABI can therefore provide a complete analytical picture of the flow about a model each time a measurement is made.



Langley began developing the LVABI in 1976 and, in 1980, initiated work on a more advanced second generation instrument in cooperation with Macrodyne, Inc., Schenectady, New York. Langley and Macrodyne also teamed in a technology utilization project to commercialize the technology. At left is the LVABI instrument; above, a Macrodyne engineer is testing its circuitry.

The LVABI has application in a variety of research, industrial and defense functions that require precise flow measurement. It is, for example, used in parametric measurements of fluid flow in chemical processing and electricity flow in utility operations. Customers include a number of government and private research laboratories, university research centers, industrial companies and electric power utilities. ▲

